

CLAIMS:

1. A percutaneous gas-line for a medical device, the gas-line including:
a first gas-line part adapted to be wholly implanted in a patient and having a first
5 end adapted for sealing connection to the medical device and a second end with a
connection fitting; and
a second gas-line part adapted to be part-implanted and part-external and having
a first (external) end adapted for sealing connection to an external driver and a second
(implanted) end adapted for removable sealing connection with the connection fitting on
10 the second end of the first gas-line part.
2. The gas-line as claimed in claim 1, wherein the second gas-line part is further
adapted to be removable, for replacement, in the presence of persistent exit-site infection.
3. The gas-line as claimed in claim 1 or 2, wherein the first (external) end of the
second gas line is removably connected to the external driver.
- 15 4. The gas-line as claimed in claim 1, 2 or 3, wherein an ECG lead adapted to
connect a patient's heart with a control system for a heart assist device is incorporated
into the first gas line part and/or the second gas line part.
5. The gas-line as claimed in any one of the preceding claims, wherein the second
gas-line part is constructed to have a minimal outside diameter, high flexibility and a
20 resistance to kinking.
6. The gas-line as claimed in claim 5, wherein the second gas-line part has an
outside diameter less than 7 mm.
7. The gas-line as claimed in any one of claims 1 to 4, wherein the second gas-line
part is made of a soft biocompatible, biostable material.
- 25 8. The gas-line as claimed in claim 7, wherein the second gas-line part is made
from silicone 45-65A durometer.
9. The gas-line as claimed in any one of the preceding claims, wherein the
connection fitting is a Luer-lock or similar gas-tight fitting.
10. The gas-line as claimed in any one of the preceding claims, wherein the first
30 and/or second gas-line parts have a fluffy polyester, or similar, collar over about a short
section of their implanted length.
11. A method of providing heart assistance to a patient using a percutaneous gas-
line having a first gas-line part, adapted to be wholly implanted, and a second gas-line

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part, adapted to be part implanted and part external, connected to the first gas-line part, the method including the steps of:

- (1) recognising a persistent exit-site infection;
 - (2) disconnecting the second gas-line part from the first gas-line part;
 - 5 (3) removing the second gas-line part from the patient; and
 - (4) connecting a sterile second gas-line part to the first gas-line part
- wherein the fresh second gas-line part is inserted through a fresh exit-site that is remote to the infected exit-site.

12. The method as claimed in claim 11, wherein the fresh second gas-line part is
10 inserted through an implant tunnel that is also substantially remote from the existing implant tunnel.

13. The method as claimed in claim 11, wherein after step (3), the first gas-line part is sealed and wounds are closed to allow healing to occur.

14. A gas line for connecting an inflatable heart assist actuator to a driver therefore,
15 the gas line having a first end operatively connected to the inflatable actuator and a second end connectable, directly or indirectly through an extension gas line, to the driver for the heart assist actuator, the gas line having attached to it an ECG lead, the ECG lead having a first end adapted for connection to the heart of a patient and a second end adapted for connection to the driver or a controller for the driver, the attachment between
20 the gas lead and the ECG lead being such that they are adapted to pass through the skin of a patient as a single element.